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Sloan's Crossing, Pond Walk...

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US Dept
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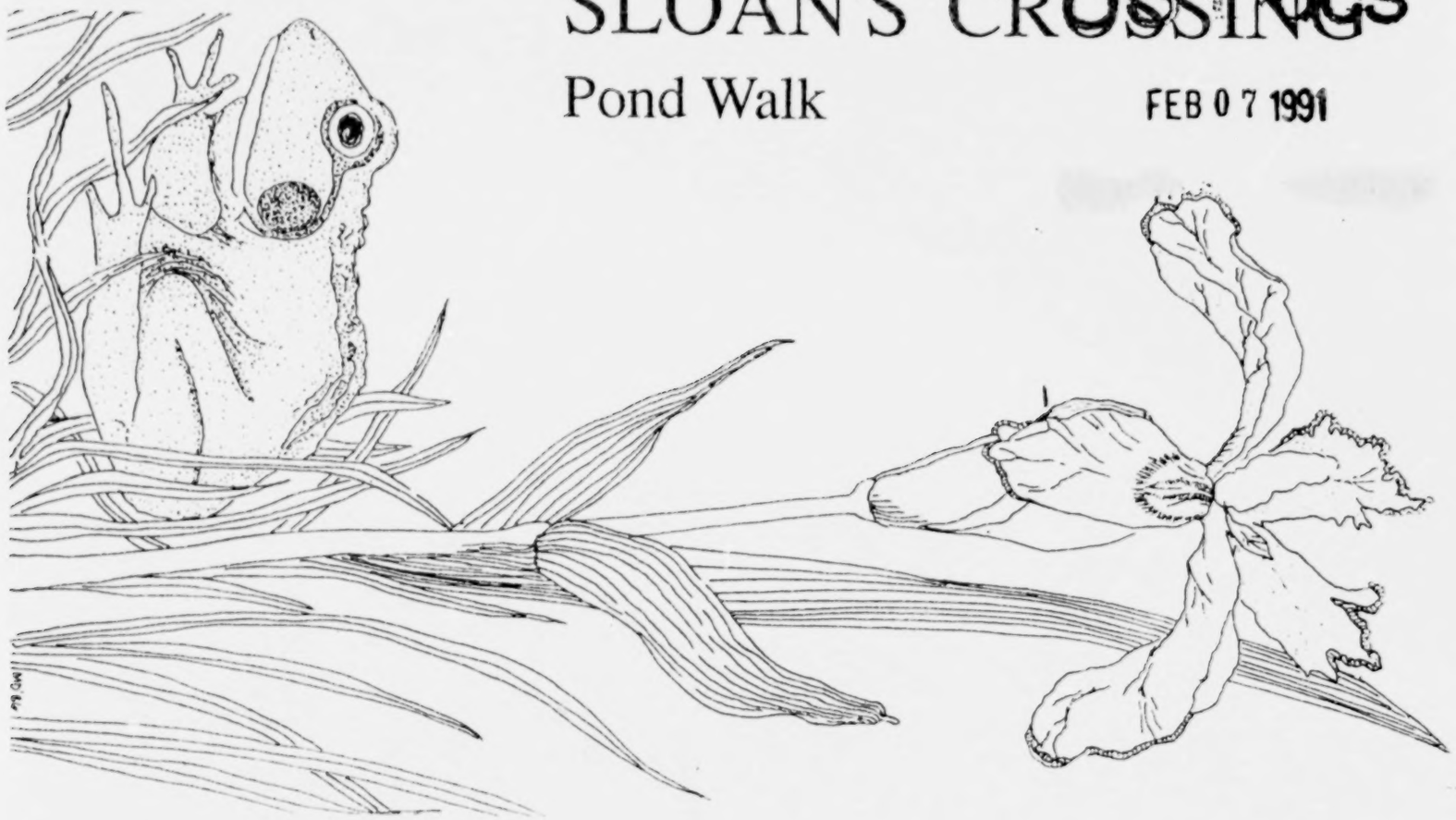
SLOAN'S CROSSINGS

Pond Walk



Written by David A. Dutton
Illustrated by M. Bridget Dutton

Welcome to Sloan's Crossing Pond.

Here you can become acquainted with many unique types of plants and animals and learn of their interactions with one another and their environment. The easy quarter-mile loop trail starts and ends here. Walk quietly around the pond, alert to little things along the way. Nature's sounds and aromas will make your trip special. Look for wooden posts with numbers inscribed in them. They correspond to the paragraphs in this booklet. The first numbered post is located straight ahead along the trail. On your way now—good luck and happy discovering!

NOTE: For your protection stay on the trail. Poison Ivy, ticks, chiggers and poisonous snakes may be encountered.

1 seemingly so simple— yet so complex

A pond is commonly described as a quiet body of water so shallow that rooted plants can grow completely across it. The pond bottom is usually covered with mud and organic debris. Ponds can be formed in different ways, but despite their differences in origin, they are much alike in size and depth. Ponds are only temporary features of the landscape, and are subject to a natural process known as "filling-in." During this process, ponds eventually become smaller and more shallow as sediments wash in from the surrounding landscape. There is another "filling-in" process that makes the pond smaller as well. As aquatic vegetation, such as cattails and pond lilies, die, their leaves and stems accumulate on the bottom. Slowly they decompose and become part of the muck and ooze of the bottom. In this way, the pond will become more and more shallow. As you walk along, be alert for signs of this process. Is the pond becoming smaller? Shallower?

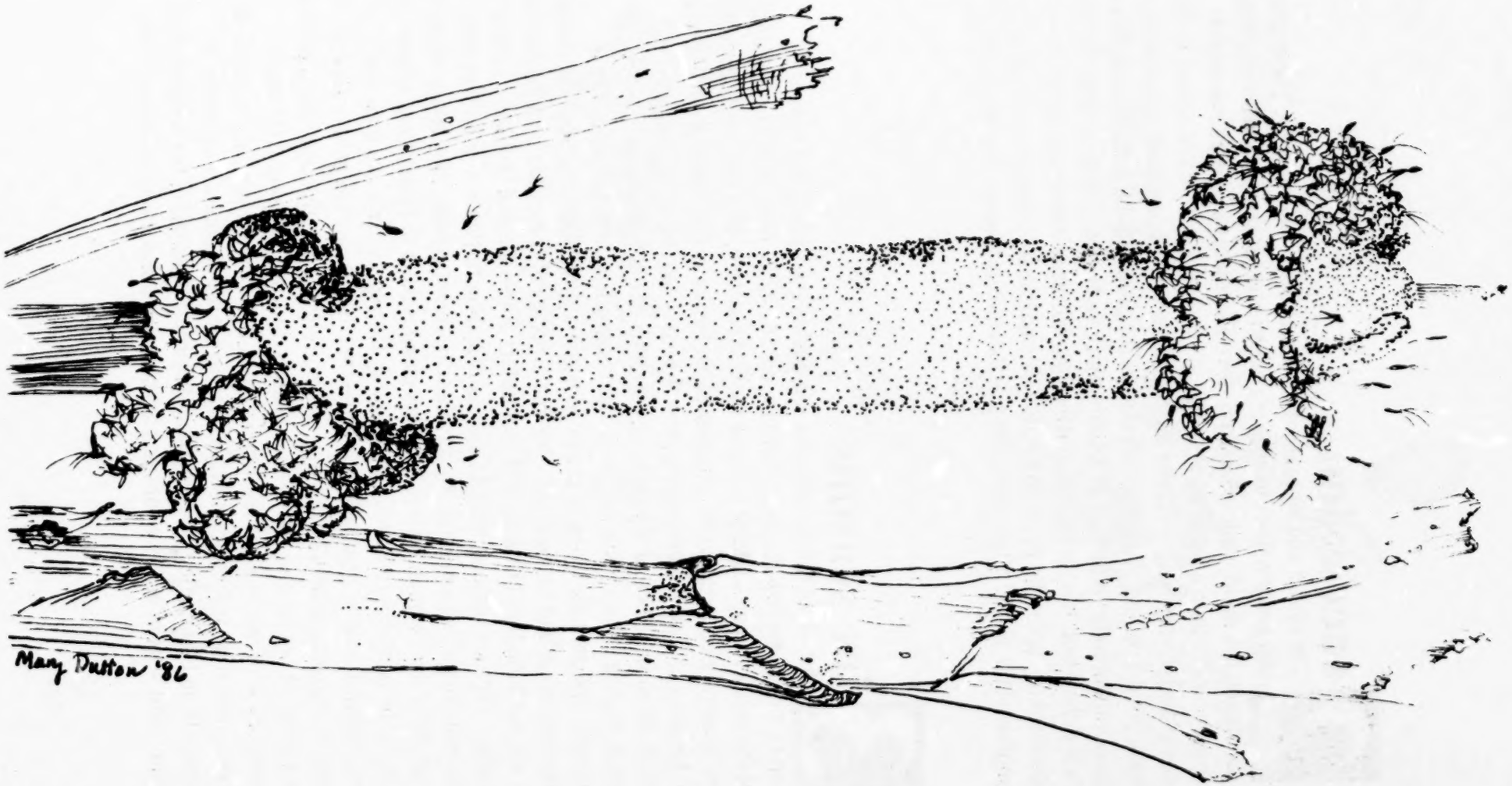
Spring Peeper

2 succession

The plants and animals of a pond change continuously. These orderly and progressive changes are called succession. Some changes during succession are rapid while others are slow. For example, nature sometimes requires more than a hundred years for the succession of life in a pond to be completed. Everything you now see was once agricultural land surrounding a farm pond. Joe and Violet Herron owned the property and sold it to the federal government to become part of Mammoth Cave National Park in 1932. In sixty years, the forest has reclaimed much of the farmland and is now slowly encroaching upon the pond. What do you suppose will happen to the pond in another sixty years? Will it become a woodland and succession be complete?

3 the seasons

Our visits to natural areas sometimes last only a few days and sometimes just a few minutes. Because our visits are brief, we are often unaware of the many changes taking place in the environment. However, subtle changes are occurring on a daily and seasonal basis. For example, many animals remain in burrows or hide in dense plant growth by day. At night, they emerge and move about in search of food. As the seasons of the year change, so does the pond. During winter, with the pond often beneath ice, the tempo of life is slowed. The animals living in the pond begin a general migration to the deepest, warmest water and to the muddy bottom. Species of fish either become dormant in the pond mud, or hover almost motionless above the still bottom to conserve energy. Reptiles and amphibians such as snapping turtles and bulllfrogs also hibernate in the bottom mud. As the water becomes colder, they obtain oxygen from the water through their skins. This enables them to spend long periods of time in the pond bottom without drowning. During hibernation, their body temperatures drop to near-freezing while their heartbeats are greatly slowed. In addition, these creatures have a natural antifreeze called glycerol which protects their internal organs and body fluids from completely freezing. Life again flourishes with the onset of warmer weather. Spring warming causes plants to bloom, immature insects to molt and take to the air as adults, and turtles to emerge from hibernation. Pond activity is busiest throughout the summer. In autumn and winter, activity subsides as the water temperature becomes colder.


Mary Dutton '86

4 pond habitats

The pond has a wide variety of plant and animal habitats. Habitats are places in which distinctive groups of plants and animals are found. For instance, Sloan's Crossing Pond has three easily recognized habitats—the surface film, open water and the pond bottom.

The **surface film** is actually the top of the water. It is the habitat of surface dwelling pond animals such as Whirligig Beetles and Water Scorpions. These animals are equipped with special devices that allow them to walk on top of the water without breaking through. They often feed on floating plants, one another, or insects which have drowned and float on the surface. Free-floating plants, such as duckweeds with their little dangling rootlets, are also adapted to life on the surface film. These tiny plants rarely produce flowers, but sometimes form dense green mats on the pond's surface.

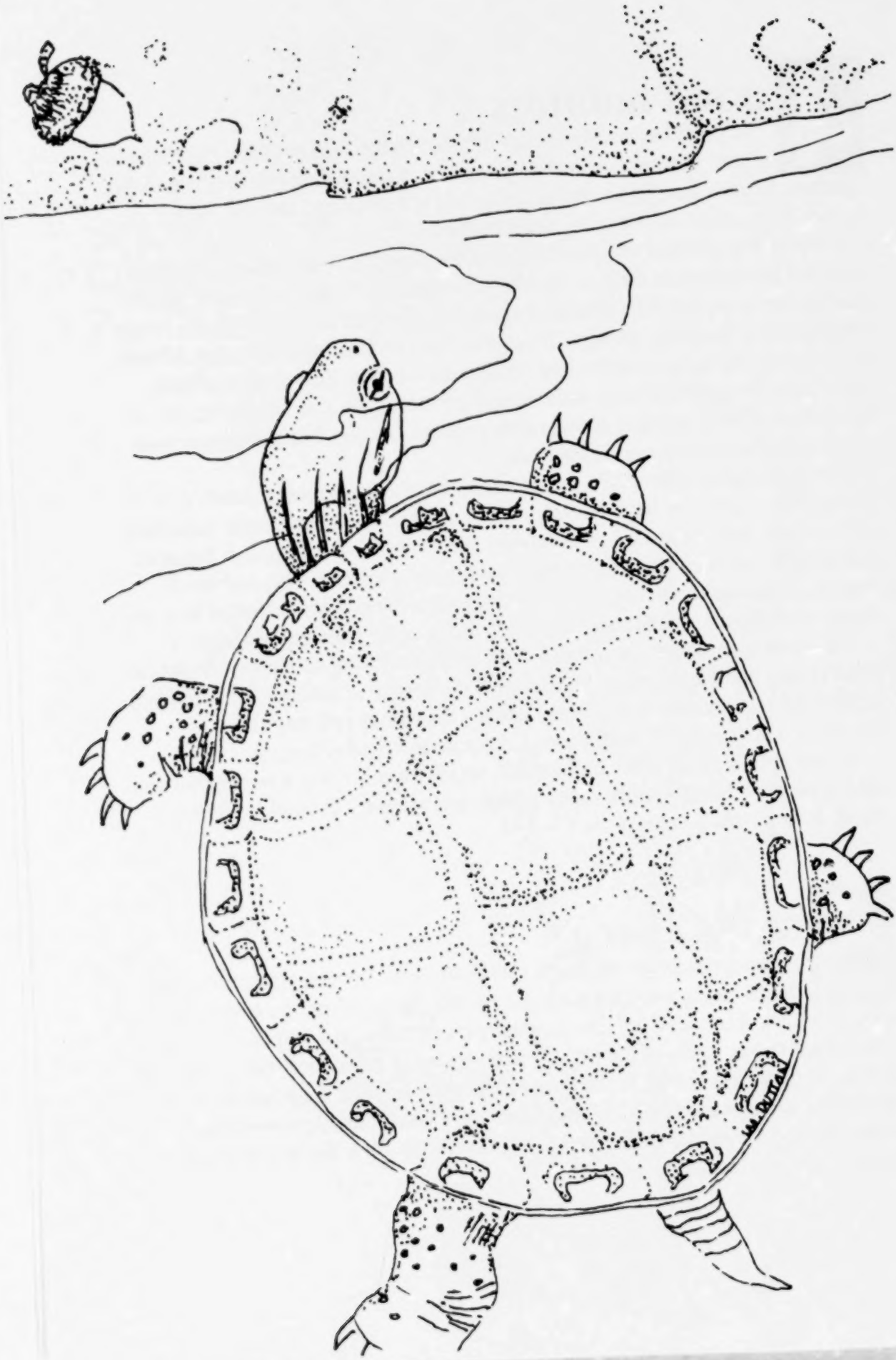
The **open water** habitat of a pond ends where there are rooted plants. Life in this habitat consists of large free-swimming animals and microscopic plants and animals that drift suspended in the water. Turtles, birds and large fish frequent this type of habitat. Small suspended plants called phytoplankton and small suspended animals called zooplankton live in this open water habitat. These tiny plants and animals are the most important foods in the pond environment.

The **pond bottom** habitat offers a wide variety of living conditions. Since the water in this pond is quiet and undisturbed, the bottom is covered with mud and organic debris. Animals such as crayfish and the nymphs of mayflies, damselflies and dragonflies all burrow in the pond's muddy bottom.

As you approach the shore of the pond, watch for scurrying water beetles and other insects all muddying the water as they quickly bury themselves in the muck, hiding from predators.

5 sun's energy

Plants form the most conspicuous part of the pond environment. Only plants can convert the sun's energy into chemical energy stored in food. The cattail is one of the first flowering plants to invade the pond. The short flowers are on the stems of the plant. Some species of cattail bear two masses of flowering parts. These brown seeds spread to other areas of the pond. Cattails are rooted in the muddy bottom, while their stems and leaves are above the water surface. Beyond the cattails are the pond lilies. Their flat leaves cover most of the pond's surface.

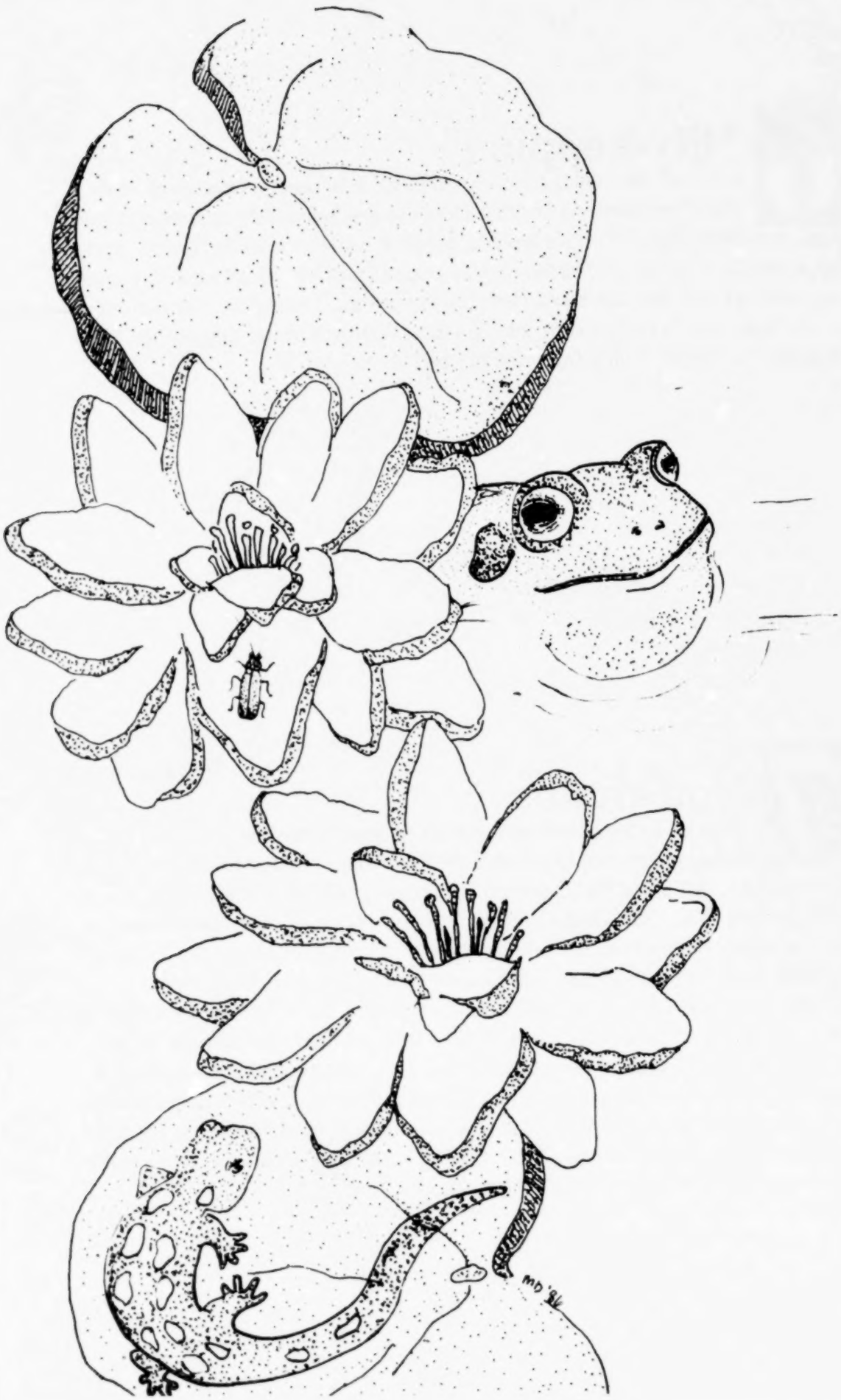


6 "lily-hopping"

Lily pads are widely distributed in shallow ponds. They grow from thick branching rootstocks which are anchored inthe soft mud of the pond's bottom. Many lily pads have bright pink, yellow or white flowers, and large flat floating leaves that may cover a pond's surface. Small aquatic animals lay their eggs on the leaves and stems of water lilies. During the warm months of the year, you can often view insects such as damselflies or dragonflies "lily-hopping" or simply flying from one lily pad to the next.

7 food chains

What do living plants and animals in a pond have in common? The common denominator is that they are either making food or consuming it. All green plants from microscopic plankton to pond lilies, manufacture food. Plants become food for plant-eating animals (herbivores) such as mayfly nymphs and small crustaceans. These animals are preyed upon by flesh-eating animals (carnivores) such as young fish and beetle larvae. Turtles, frogs and larger fish feed upon the smaller fish. When these animals die, their bodies sift to the pond's bottom where they gradually decompose. In the process, they release the basic nutrients that green plants need for sustained growth, thereby completing the cycle of food in a pond. This process of eating and being eaten is known as a "food chain." In ponds, food chains usually are quite complex. If there are any links missing in the food chain, the entire pond community will not survive for long.



8 "jug-a-rum"

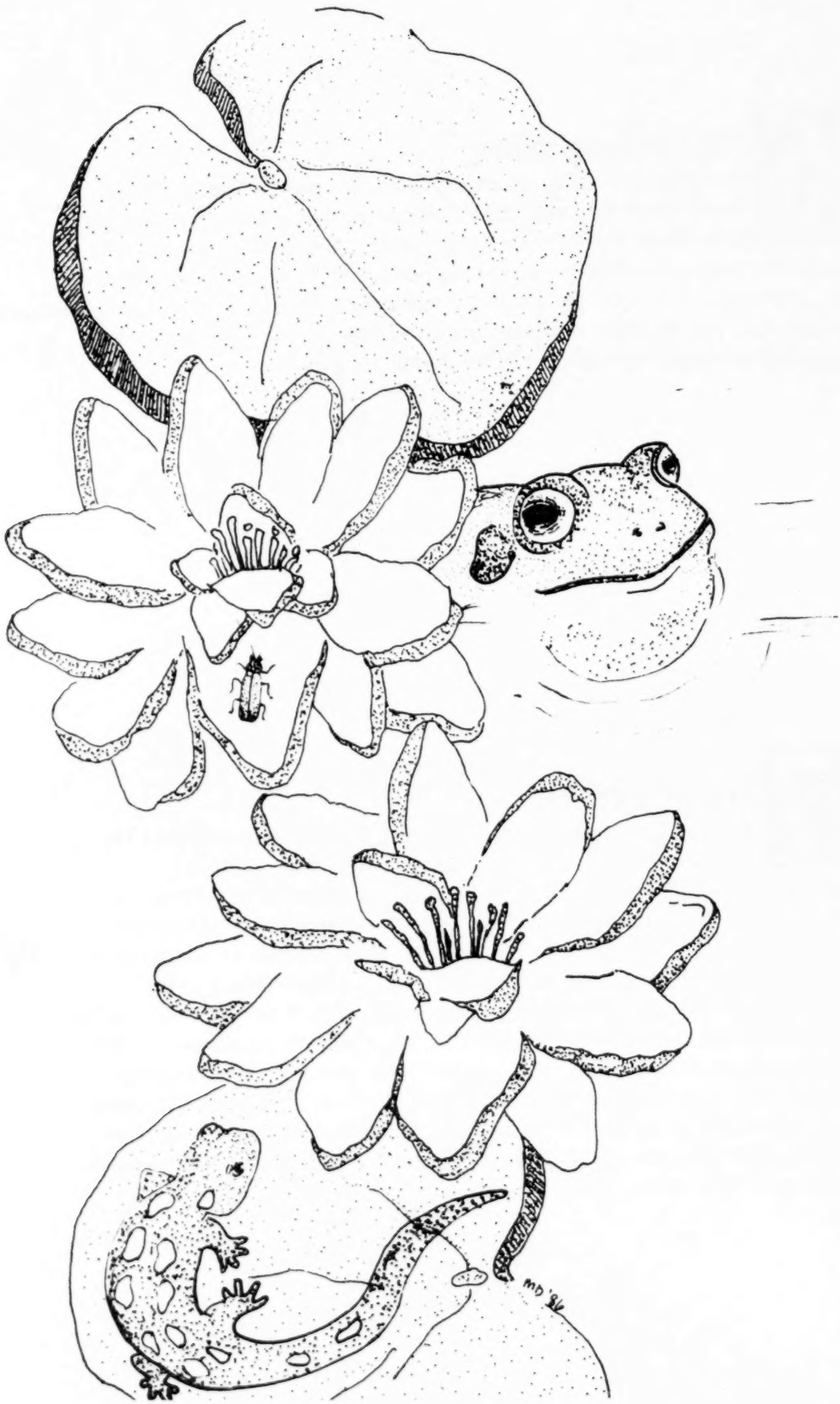
Frogs, toads, salamanders and newts are the most common amphibians inhabiting a pond. Amphibians live mainly in the water or along the shore of the pond. They choose this habitat out of necessity, because their skin provides little protection against drying.

Amphibians begin life in a gilled larval stage. We know them as tadpoles. While they are in this stage of development, they are entirely aquatic. Some adult amphibians live on land, others remain aquatic, although all must return to the water to lay their eggs.

In the spring and early summer, the pond reverberates with sound from the choruses of frogs. This is especially pronounced at night or after a rain. Perhaps the loudest of all the choruses is the familiar deep-toned "jug-a-rum" of the bullfrog. The bullfrog is the largest frog in North America, sometimes growing to a length of 8 inches. Female bullfrogs lay large sticky egg masses sometimes the size of basketballs. Their gigantic green bodies can be seen perching on lily pads or logs. As you approach, you will most certainly hear a "plop" sound as they splash into the water to seek cover.

9 turtles

Turtles are the most characteristic reptiles of ponds. Their lower shell, or plastrom, is joined to a dome-shaped upper shell, or carapace. Many turtles typically draw their head and feet inside their shells for protection. Turtles have no teeth, but have sharp bony jaws. Females will deposit eggs in a hole they have dug and then cover them. The eggs are incubated by the sun's heat. In aquatic food chains, turtles are the top consumers because they feed on smaller aquatic animals and rarely become food themselves. During the winter, aquatic turtles bury themselves in the soft, muddy bottom of the pond and hibernate. During warm weather, you might see them basking on a log or an island in the pond.



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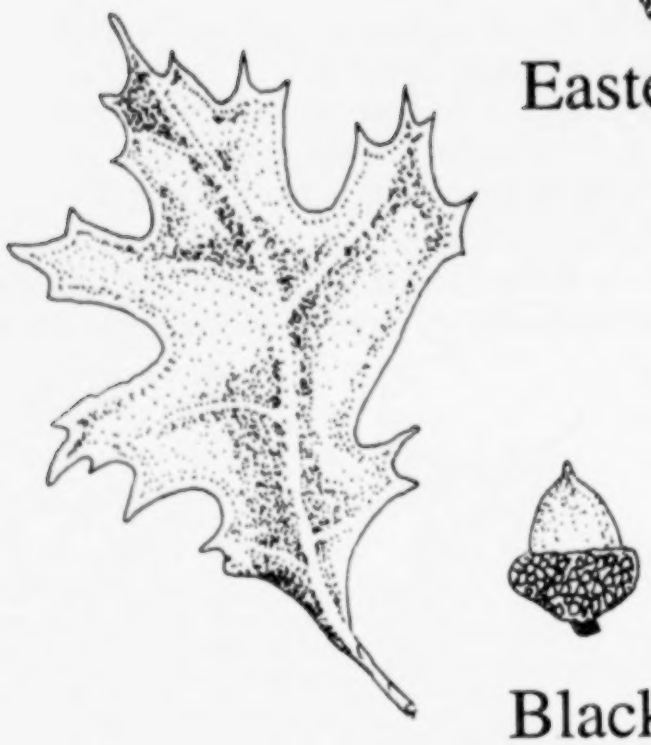
Eastern Red Cedar



Black Oak

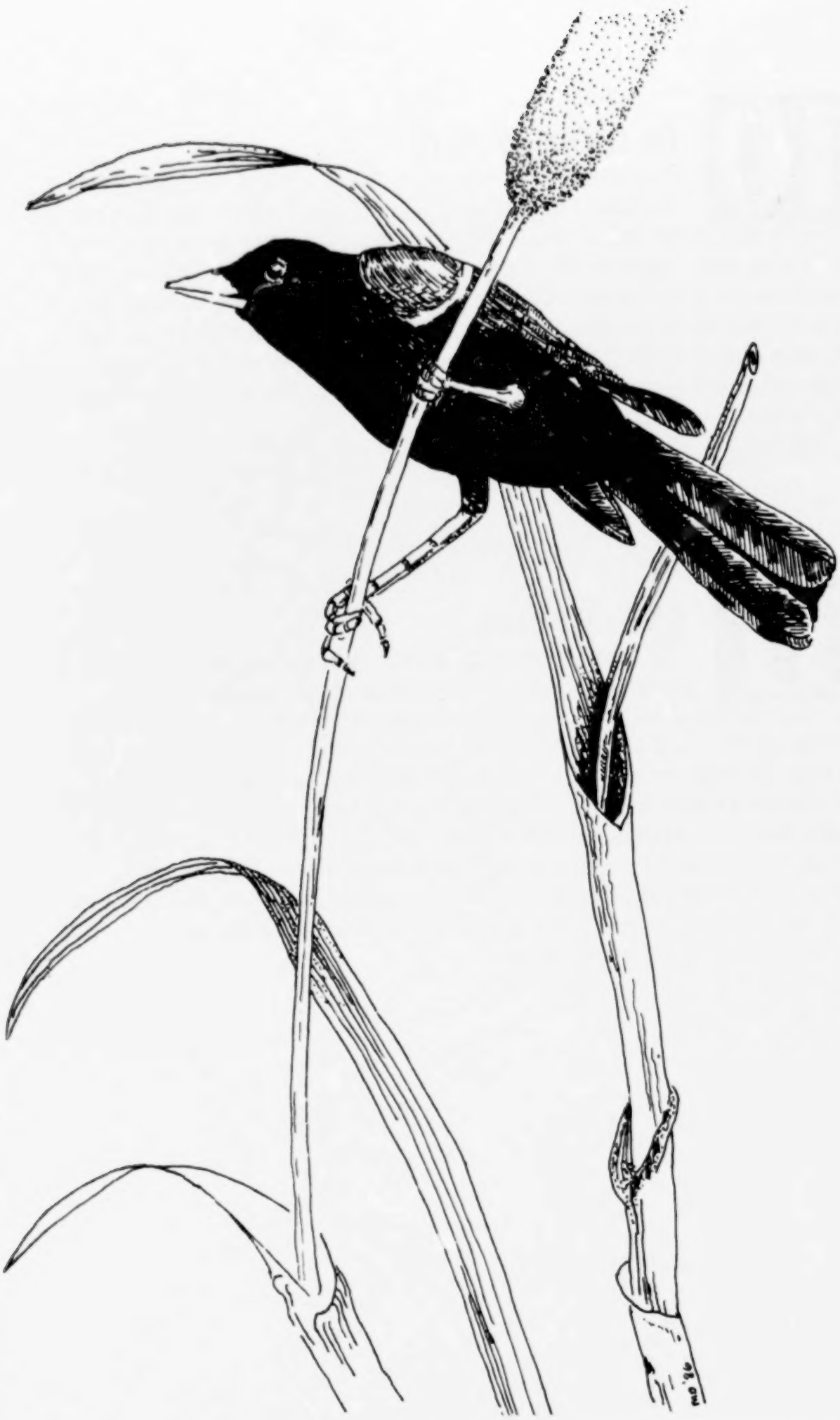
Pignut Hickory

10 beaver pond

This pond is referred to as "Beaver Pond" because the National Park Service once released beaver into it. The animals multiplied and by their activities, actually made the pond somewhat deeper and larger. They dug burrows which had underwater entrances along the banks. Their burrows have since collapsed and are now visible along the shoreline. What does this tell you about how high the water level in the pond might once have been? As you walk, you may notice many more collapsed tunnels. Perhaps the expression "busy as a beaver," is quite an appropriate one.

11 evergreen

The forest is inching its way closer to the pond. Dead pieces of aquatic vegetation continue to add soil to the shore of the pond and give seeds of trees an ideal place to germinate and take root. The dark evergreen trees you see around you are Eastern Red Cedars. During succession, cedars are usually the first trees to invade abandoned farm fields and shrinking ponds. They prepare the soil and shade the ground for broad leaved tree seedlings such as Oaks and Hickories. Smell the evergreen needles and the berry-like dark blue fruits. This aromatic wood is used for fenceposts, furniture, cabinetwork and carvings. Cedar lined closets and cedar chests offer the best protection against clothes moths.



12 on leaving

Before leaving Sloan's Crossing Pond, pause a few brief moments to reflect. Take a long look at the pond and the surrounding landscape. have you experienced anything unique? Have you touched and felt the different textures and listened for the sounds of the pond? Henry David Thoreau once wrote in his journal, *"I want to go soon and live away by the pond, where I shall hear only the wind whispering among the reeds. It will be success if I shall have left myself behind. But my friends ask what I will do when I get there. Will it not be employment enough to watch the progress of the seasons?"*

When next you return, the pond will have changed, if ever so slightly. The forest will have crept closer to the pond and reclaimed some more of the shoreline. The endless variety of strange pond creatures, large and small, swift and slow, will be replaced by other creatures striving to fill a place in the household of nature. When and if nature allows that to happen, the change of succession from pond to forest will be complete.

You are welcome to take this booklet with you. Should you have no need of it, please return it to the trailhead box.

Notes